CalPERS ASSET LIABILITY MANAGEMENT WORKSHOP
SEGMENT 5

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Segment: Asset Liability Management Workshop
Host: Chairman George Diehr
Guests: Joseph Dear, Farouki Majeed, Ray Venner, Richard Roth

George Diehr:
Farouki? We have, somebody from the public will speak first. We'll start it off, and then you've got it. So. Yes. Marguerite, Marguerite Young from SEIU has asked to make a public comment. Yeah.

Margerite Young:
Good morning. Thank you for the opportunity to address this workshop. My name is Marguerite Young. I'm with the Service Employees International Union, Capital Stewardship Program. As I think everybody in this room knows, SEIU represents 235 or 40 thousand (235,000 or 240,000) members in CalPERS.

For our members, the decisions you make here are vitally important. We know that our employers are feeling the stress of making pension contributions and our members are feeling the pain of the still lagging economy. And, government starved at the revenue they need to provide (indiscernible 00:01:17) services. They have faced and will face more layoffs, furloughs and benefit takeaways as we continue to recover from the ruin caused by Wall Street. Until our economy truly recovers in a way that builds our communities and provides jobs which build a middle class, our members and their employers and this pension fund will continue, we fear, to feel the pain of a bubble bust economy. As Michael Schlachter said yesterday, the return risk profile of CalPERS has a tremendous correlation to the macro environment, macro economical environment.

We don't have a particular position in as far as what percentage the portfolio should go in which bucket. The asset allocation process, as important as it is, is still largely an exercise of how to manage risk and return inside the walls of the portfolio based on some presumptions about economic and market conditions over the next few years. And that's appropriate. We believe, though, that CalPERS needs to go beyond the asset allocation process and do more to better position itself as a long term investor both in and outside the four walls of its portfolio, or else, the fund risks being in exactly the same discussion three years and 15 years from now trying to be a long term investor in a financial culture that is only focused on the short term.

Here are the questions that we would ask: Following this asset allocation process and decision next year, how do we gain a better understanding and strategy for addressing the political, institutional, legal, business and market conditions that truly underpin the macro economic environment which this fund depends on? How do these preclude CalPERS from truly acting as a long term investor? It's more than interest rates and inflation. We believe that you must also look at employment and other long term economic trends such as the relationship

between wages and productivity, just as you are doing with the impacts of long term climate change. Are there practices in the implementation of the asset allocation strategy that are contrary to our long term interests and what can we do to change them? And, finally, what are the investment beliefs that underpin such a strategy?

We very much appreciate the questions and comments that many of you made yesterday along these lines. Keep asking those kinds of questions. There is a reason that a board of stake holders acts as trustees for this fund. You bring your experiences as members, as elected officials, and employers dealing with the effects of this economic climate on the communities of people whose interests you represent at this table. It is your job to bring your humanity to this process and to look for synergistic outcomes that marry the pursuit of competitive long term risk adjusted returns that also drive long term growth in the real economy. Thank you.

George Diehr:
Thank you. Alright, we, huh, Mr. Dear to kick off today's session.

Joseph Dear:
I thank Mr. Chairman, members of the committee. Now we're going to focus on portfolio choices and preferences of the members using the decision factors that we outlined yesterday. We'll go through a series of choices which we hope will, and I'm confident will, generate discussion among the members to help guide the staff towards a preferred portfolio which we will use to develop an investment policy and changes, specific changes in policy to bring back for your consideration in December. And, with that I'll turn it over to Farouki, Ray Venner, and Rick Roth.

Farouki Majeed:
Thank you, Joe, and good morning Mr. Chairman and members of the investment committee. So, the first session we're going to present to you the range of optimized portfolios that have been developed, and that's based on the input assumptions that have been discussed with the committee on a number of occasions earlier this year.

I'd like to state, for example, that on Slide Two where we show the input assumptions, those assumptions were developed taking into account assumptions developed by our consultants, Wilshire, PCS, as well as other consultants, and staff input as well. And, what you see here is a consensus set of assumptions that were developed through that process. And, I'd like to say that I believe that are reasonably prudent using reasonably good investment standards as well. And the range of portfolios that have been developed that Ray Venner is going to outline, which are listed on Page 3. We believe, also, within reasonably prudent ranges in terms of risk and returns. So that's been the objective in terms of generating the set of options that are set up before you, and

we'd be happy to go into details as we go through the presentation. So, with that I'll turn this over to Ray Venner who will walk you through the presentation. He's the portfolio manager in the asset allocation unit.

Ray Venner:
Thanks, Farouki. And, yesterday Bob and Rick introduced eight alternative policy portfolios that I refer to as baseline portfolios. In this session we will review the underlying asset class forecast returns and constraints. We'll identify other portfolios resulting from different constraints and, finally, we'll review some characteristics of the baseline portfolios.

On Slide Two, forecast asset returns are based on staff presentations to you in June and September. The assumed equity risk premium over bonds is 4% and private equity is assumed to up front public equity by 1.25% per year compound. In recent months three investment firms, GMO, First Quadrant and Research Affiliates presented their forecast investment returns to you. All three forecast investment returns below the 7.75% compound that we're assuming. On Slide Two, the two right columns of the top table list the constraints of the baseline portfolios. A constraint is the minimum or maximum target allocation of an investment. Minimum target weightings to bonds are intended to provide a hedge against economic weakness. These minimums are 15% for a diversified fixed income. One percent for inflation linked bonds, and 4% for treasuries. Maximum target weights are assigned to the illiquid investments with private equity target capped at 14%, real estate at 10, and infrastructure and forestland combined at three. These constraints were set by staff primarily based on invest ability and to a lesser extent on current pricing.

For the eight baseline portfolios, the maximum target weighting to all illiquid investments is 27%. During the last downturn some funds heavily invested in illiquid assets were forced to sell at distressed pricing. Our intent is to keep the allocation of non-publicly traded investments small enough so that during the next crises we're not forced to liquidate at fire sale pricing as we were not in the prior downturn. For private equity a 14% allocation is a $30 Billion dollar portfolio. A larger allocation could start to compromise expected returns. The real estate portfolio is currently 7% of the total fund. So we think that a 10% target cap is probably the most that we could invest in prudently over the next few years.

And, again, these are targets, so there's going to be a, we typically have a minimum and a maximum allowable investment around this target.

Similarly, for infrastructure and forestland combined, 3% is well above the current actual weighting of one percent. The proposed inflation linked asset class comprises inflation linked bonds and commodities. The inflation linked bond target is capped at 3% in part because of low even negative yields. The yields of, as you know, of tips, or U.S. inflation link bonds are the lowest today that

they've ever been since their inspection 13 years ago. Commodities is capped at one percent in part because of potential for extreme losses.

Slide Three lists the baseline portfolios. The expected, and these baseline portfolios are what we show characteristics of in this session, and the next session Rick will be presenting decision factors on these eight baseline portfolios. The expected compound return is 6% for Portfolio A-1 up to 7.5% for A-8. Portfolio A-8 has the highest possible compound return given our forecast returns, or, forecast asset class returns and constraints. Portfolio A-7 is a proxy of the current CalPERS policy portfolio. It is very similar in the asset class weightings, and it has an expected compound return of 7.4%. The higher number portfolios to the right have more equity at the expense of bonds. The equity weighting ranges from 32% for the most conservative, up to 67% per portfolio A-8. The investment, the target investments are the same for all the other asset classes. The target investments are the same across all eight portfolios because of the constraints. For all eight portfolios the measure of risk is volatility. That's the annualized standard deviation of returns. The estimated volatilities are premised on returns being normally distributed. Historically, equity returns have been normally distributed on the upside, but unfortunately extreme losses have occurred more frequently than what we would have expected if returns were normally distributed. When we attempt to capture non-normality in our modeling what we find is that for any given return the estimated volatilities are higher, especially for the riskiest most equity dominant portfolios.

Slide Four. Yeah.

Priya Mathur:
I have a comment, Mr. Chair.

George Diehr:
Yeah.

Priya Mathur:
I'm sorry to interrupt you, Ray. But I think it's important to note that A-7, which is sort of a proxy for our current allocation, does not leave us with a seven point and three quarters return that we've been assuming to date. And I think that's an important point, particularly for the gentleman from Orange, the City of Orange who spoke to us yesterday. That actually none of these portfolios would deliver seven and three quarters, which we've been assuming up until now.

George Diehr:
I'll piggyback on that. I, huh. Exactly. She's right. A couple of comments. First, I realize that this is a consensus and you've (indiscernible 00:14:05) several people who came and gave us lower estimates. But, I did look back at the appendix of what Wilshire had estimated on these. And, in terms of real returns, they're about a half percent higher on virtually every one of the asset classes

because they're using only a, they're using only a 2.5% inflation. But, uhm. And, on some they're lower on a couple. I think they're lower on commodities by half a percent, and one other one. But they're an additional half percent higher on fixed and 35 basis points on real estate, and 25 on inflation link bonds, which is not, again, not a very big class. So, had Wilshire's assumptions been used, that would have lifted everything down below by somewhere between a half, roughly a half to, or 50 to 75 basis points, which would, you know, look better with no, I think their risk factors are virtually identical. Actually, their real estate risk measure is lower, as is their commodities with less variance.

I'm also, I have some concern that the set of portfolios you've given, not that we would pick, I call them A-9, A-10 and so on, but it's very much shifted toward what I would call low return. And, in my opinion, I really can't imagine us say going to any of those in the A-1 through A-4 group. We heard yesterday what impact those kinds of, well, you take that nominal return and you knock some cushions off, but A-4 is probably 6.5%. And that would, the impact on contribution rates would just be, would be huge. So, and I'm told if you go, to what I'm calling A-9, huh, A-9, A-10, that aren't here, the risk starts to really climb. Okay. I mean, I can see it going up from A-6 to A-8 quite a bit. But I just think we should have had those to give some perspective. It feels to me like, you know, now if I pick, if we move to A-8 we're really out on the tail. But, in some sense I think that ought to be more toward the middle of the set of choices. Again, not every … may agree with me, but those, if anybody here who would advocate some higher level of risk, there really isn't, there really isn't an alternative for them.

Farouki Majeed:
So, not to be, this to address your two points, and the last one first. So, the, the fact that the portfolios are getting, so the maximum return portfolio is A-8 at seven and, seven and a half or so, is primarily due to the constraints. The only way to achieve a portfolio with a higher return than 7.5 would be to relax the minimum constraint on fixed income, which means that you go below 15% on fixed income given these assumptions and, if you combine all of the fixed income elements here, they roughly correspond to about 20%, which is about the level that we have. And we sort of limited it to that level. We didn't want to go below that level for fixed income.

George Diehr:
Okay.

Farouki Majeed:
So, that will be one way to kind of develop some room on the upside. With regard to the Wilshire assumptions I think, you know, you're right. I mean, their assumptions are what they are. The consensus was developed using the inputs of a number of other consultants as well, and some of them were lower than …

George Diehr:
Yeah.

Farouki Majeed:
… Wilshire on some of the points (indiscernible) …

George Diehr:
Right. Yeah, I understand that. Well, I had asked at one time that we, that we, because we know that outputs are very sensitive to input.

Farouki Majeed:
Yes.

George Diehr:
And we put down numbers, and sometimes people begin to really believe that fixed income return is 3.7500 and, and, we know it's just …

Farouki Majeed:
Right.

J J Jelincic:
We know it's not.

George Diehr:
… a guess. So, would, but. Briefly on a third point. I also have some question about the caps on the private equity, the AIM and the real estate. I noticed that we were at 12%. I don't know whether that was an allocation or actual, again, from charts that Wilshire displayed yesterday. I think in the, before things came apart on real estate, I think we were, we may have had 12% of the portfolio in. So, and I can agree that maybe we couldn't go from the current seven to ten quickly, but I don't know if I agree that, that we would begin having market affects, or we wouldn't have good options if we went above ten, and some believe that there wouldn't be good options in. Private equity and in infrastructure, and we know a lot of funds that are very heavy in infrastructure, and there's a country is falling apart, and I think there would be, not overnight, but in time, opportunities there. So, I would like to see some a little … not, you know, you're last set that we'll get to where you just, you throw everything off, but as your footnote says, this is just sort of for amusement almost because it does things that are not acceptable. I'm looking for something kind of, you know, in between that would ease some of these. Because what you've done is, in many asset classes, sort of locked us right into a no change scenario. By the lower bounds on the fixed, the upper bounds on the real estate and AIM we're just pretty much, probably going to end up pretty much where we are.

Farouki Majeed:
Right. Right. Yes.

George Diehr:
So that's.

Farouki Majeed:
You're right. That's the, sort of the result of the constraints. One of the things to keep in mind is you will add up all of the illiquid, even at the current level of 14% for private equity and 10% for real and 3% for. So that's roughly about 27, 28% or so of the portfolio. Which, in terms of the sort of limited prudence that we are attempting to apply here, we think it's sort of reaching about the limit of all illiquid assets. Because that's, as Ray was outlining, there were funds that had 40 or 50% allocated to these types of asset classes that we're forced to liquidate during the time of the crises as a result of the liquidities squeeze that we felt. So we believe that somewhere around 28, 30% or so is the sort of prudent limit from, or for illiquid assets from those points of view.

The other aspect is that, that will also then begin to impact the income return portfolio. If you were to more (indiscernible 00:21:09) allocate to say private equity at the expense of fixed income, then that would be the best tradeoff in terms of trying to improve the return. Beyond this level would be to relax the fixed income constraint and allocate from fixed income to private equity. That would be the best tradeoff in terms of trying to get a higher return. And, and not so much, you know, the other fair trades.

Michael, do you have any comment?

Michael Schlachter:
I don't want to beat the dead horse. But, just back to the question about the assumptions. Our published assumptions in the back were as of January of 2010. And, staff, Wilshire, PCA, others, did get together earlier this year and came up with a set of assumptions that I think were a little bit higher on things like fixed income. Because this meeting is so late in the year, those discussions were held again to revise your assumptions. We actually began our process, huh, we actually began our process coincidently yesterday for the 2011 assumptions, and our assumptions are significantly lower mainly because bond yields have fallen so much over the past 10 or 11 months. So, in the appendix, yes, our assumption in January was much higher. But, if you were to ask me today what our assumption is, it would be a bit lower. Stocks are about the same, but bonds are a bit lower. I think at the end of the day you can find plenty of folks who have hirer assumptions than us, plenty of folks with lower assumptions than us, your assumptions are the basis from input from about six or ten different parties. It's all a best guess. We'll all going to be precisely wrong. Hopefully, we're directionally right. So. I'm not sure I'd made decisions based on just these assumptions. That will not be …

George Diehr:

Okay. That, well that, that, you know, this rather significant change over a short term raises kind of an interesting issue philosophy about setting the discount rate, the actuaries of discount rate. You know, how tightly should it be held to this? I mean, if, if a year from now the fixed income situation has changed, and therefore, the portfolio expected return goes up, do we change the discount rate, or do we wait for another three years until we have one of these sessions again? Or, or, should the discount rate itself sort of be smooth? I don't know. That, that's for another time maybe, another discussion. But, what you're saying is that, I mean, we're talking about at least, well, 10, 20, 30 plus year horizon. And, we know these rates will be wrong. But there won't be any sort of systematic changes, for better words, over probably a rather short time.

Oh, okay. Alan?

Alan Milligan:
Yeah. I just want to point out that in coming up with my recommendation for a discount rate in February I will be looking on, you know, this is explicitly a ten year expectation of investment returns. And I can't just reflect that, I have to look at the longer term. And so I've kind of got to marry these short term assumptions with a longer term assumption. And, so, my assumption, you know, my recommendation is to a discount rate will not be based just on this. It will be based, it will be less sensitive to the change than some assumptions are.

George Diehr:
(Indiscernible). I can change it. Go ahead. Thank you very much.

J. J. Jelincic:
One of the things you told us is that you put a fairly low constraint on the inflation link bonds because they currently have a negative yield. What, so what is the market saying about what they expect for inflation? And, if the market is right, wouldn't that suggest that we ought to be less constrained with the market?

George Diehr:
Ray?

Raymond Venner:
A market forecast of inflation say over the next ten years is about 2% as a lower… And we get that either, get that either by taking the difference between 10 year treasuries and tips or from, or swaps, or deflation futures. We're using, we're not, we're using, assuming a return of 3%. And, if we were to assume the, you know, market 2%, all of our forecast returns would be down a full percentage point.

Farouki Majeed:
And, what I would add to that is that that is a point in time estimate of the market. So, based on the current break even, you know …

J J Jelincic:
But these are all point in time estimates, aren't they?

Farouki Majeed:
Yeah, but they are also looking forward over a ten year horizon. So, if you look at the chart that was presented on the inflation expectations based on what's reflected in the tapes, you know, that was much higher, if you recall, in '08 and early '09 and now it's come down quite a bit, and you can be at a much higher point in a few months down the road. And, who knows what the impact of all this stimulus and all that will be. But, the consensus forecast that we arrived at for inflation at 3% sort of was in that scenario that over this ten year period, at least in years two and three and beyond, we would expect to see a higher level of inflation than we have seen currently. And, if you were to, the other impact of this assumption is that, as Dr. Diehr was pointing out, if we were to reduce the inflation assumption from three to 2% your nominal return across the board would go down by one percent as well.

George Diehr:
Okay. Priya?

Priya Mathur:
I just want to make sure I understand that a little bit more about how you arrived at the 27% constraint for all three illiquid asset classes. Did you do some analysis to determine what sort is the sweet spot and where, you know, given what liquidity needs might be in a real crises, how, how much or how little we could bear in terms of retaining the illiquid classes and not having to sell? Or, was it just sort of a discussion what that sweet spot might be?

Raymond Venner:
I'd say we came up with two different aspects. One is, from the top down, saying 27% is sort of what we have now. We weren't force to sell to liquidate during that sever downturn, others were. And then looking forward, it's really difficult to arrive at a precise number because the, the percentage, optimal percentage depends on the severity and duration of the next downturn. That's the more high level response. And the other was I think how we really came up with it was just looking at each of the three illiquid assets. And we think that maybe this. When I say we, maybe it's not completely universal. But that an allocation above 14% for AIM would be harder to find as good of opportunities as if we kept the 14 or smaller allocation. You know, real estate and the others, just given that our, given that our current allocations are seven and one percent, and we, we had discussions, what can be the most that can be prudently obtained over the next few years? And what we came up with was ten and three. So then we just added the three numbers, total of 27.

Priya Mathur:

So in your collective view increasing the AIM max above 14 would have eroded the return expectation for the asset class as a whole? Is that one way to read what you just said?

Farouki Majeed:
It's something to keep in mind. And the other one is that, one of the things that we are talking is a way to estimate the cost of liquidity. In other words, when you have these levels of allocation to these private asset classes, the fund needs to maintain a level of liquidity in order to be able to support that. So, for example, currently we have a name unfunded commitments of about $17 Billion dollars or so. And in private, in real estate it's roughly about $7 Billion dollars or so. So, if you put that together, it's about $20 some Billion dollars, which theoretically can be called tomorrow. In a sense. So, if you really compute liquidity cost to that, that's another way that it would impact the expected return. So that's, that's. So those are. So a number of different considerations that avail upon us in terms of trying to limit total illiquid to some level, you know, whether it's 27, 28 or 30 it can be argued, but beyond that it becomes a real consideration we think. So, it's a level of prudence that you want to apply.

Joseph Dear:
I think with respect. Well, let me start at the top. I think the chairman made a very important identification of assumptions that the staff made, that are constraining the choices before you. And the most important one of that is not presenting portfolios with more risk than is currently in the existing portfolio. A-7 is the current risk level. Pre-crises, that portfolio was expected to give us about 8%. And in the compound return frame seven and three quarter percent. Now it's expected to give us 7.4% without changing the risk. The temptation might be given all the other pressures on the system to increase the amount of risk in the portfolio, but we presented yesterday charts that show that we got a one in four chance at this level, at the current level of risk, of getting a 100% funding by 2030. And we have an equal chance of getting 50% funded over that same timeframe. So, the staff is saying that taking on more risk in terms of what could happen on the downside is not something we'd recommend. And, so we did make that choice.

Now, with respect with specific asset class choices, AIM is a $50 Billion dollar private equity funded funds business. And one of the things we believe is private equity works, it returns a premium, we estimate for these purposes, and you've agreed, that it's 1.25% above the public markets. That assumes success in identifying the managers who outperform the average, because the average private equity firm does not return that premium. So, how many of them are there, and what's our success rate in getting there. And, if we increase the allocation, we have to go to a much larger exposure to the mega buyout space, which is the one that showed the greatest risk in the crises, because of the high leverage of financing demand. So, so I think the program is about as big as it can reasonably be. So the constraint is, can we, are there enough managers

identified, can we find them, and then how much exposure do we want to mega cap buyout space. So that's one of the good drawback (?)

For real estate it's the most under allocated asset class. We're about 7% in terms of where we are today and we kept the target at 10. We can, over the shorter term, fill that with read exposure, which you had discussed earlier, in which the staff had a large discussion last week. But the real estate portfolio that's imagined here, an income oriented portfolio is not the portfolio we have today, which is heavily exposed to opportunistic investment. So it will take a number of years and we will be presenting a strategic plan early next year that talks about how to move that portfolio forward. But, again, that portfolio is fairly large and, if its core oriented to produce income, it probably should be a lot bigger than it is.

Finally, with respect to liquidity, it's a really important consideration. But I think, to bottom line it, one of the factors that produced the liquidity squeeze on us was the sec lending collateral pool not the illiquid asset classes themselves. At the cash forecast we showed you yesterday, roughly about a 3% negative cash drain between contributions and investment income, that's well below the typical college endowment which would have a spending policy between four and 6%. It's significantly below what foundations are required to pay out at 5%. So this is not a portfolio with excesses liquidity demand. It's just that we leaned in the crises that, you know, you have liquidity until you need it. You have to have securities in your portfolio that you can sell without having to endure distress prices to do that. So that's what the liquidity bucket is designed to do. So it's a factor to consider in the illiquid asset class, and the 27% is reasonably high among public pension funds, but it's not an absolute limit.

So there a lot of things that went into this consideration. But, Mr. Chairman, I go back to the starting point. You did identify that using the capital market assumptions we have now, the staff has not given you portfolio choices in the base cases that increase the amount of risk to the overall portfolio.

George Diehr:
Yeah, and I, I once, I wouldn't say that we were necessarily, you might even mark them unin … you know, not recommended. But you do have some here that I think you also would say are not recommend. Or, you know, A-1, they're on your list. And I have a hard time imagining (indiscernible 00:35:01) A-1, or 2, or 3, or 4, in fact. So, my point, in part, well big part, was that it, I think it sort of, if you pick A-7 you're kind of getting out there on the tails and that's only in terms of the set that have been presented. But, I think we beat this enough J. J. You want to beat it some more?

J J Jelincic:
Just, just a little.

George Diehr:
Okay.

J J Jelincic:
On the constraints, particularly the AIM and the private equity, are those constraints measured by commitment or assets?

Farouki Majeed:
Commitment.

J J Jelincic:
Okay. See, it wasn't a very long beat.

George Diehr:
That was great.

Farouki Majeed:
What that, it's on the asset value.

Comment by female panel member:
Mic. Microphone.

Farouki Majeed:
Oh, I'm sorry. And I agree with your point, Mr. Chairman, that what you're seeing as the feasible portfolio looks like it's on the outer, on the extreme end. And, on previous occasions, at least, I'm aware in '07, the current portfolio was somewhere in the middle. And, unfortunately, that's the case here because of the low expected returns. And, and the sort of minimum constraint that we have put on fixed income. So I think that's how we are getting, getting to that point. So.

Raymond Venner:
Okay. On Slide Four, list portfolios with different constraints. The expected volatility is the same for all the portfolios on Slide Four at 11.92%. Portfolios B-1 through B-3 have tighter constraints and thus lower expected returns. For portfolio B-1 private equity is capped at 12% instead of 14% for B-2. Real state target is capped at eight instead of 10. Portfolio B-1 has a higher return than B-2. Compared to real estate, the upper limit on private equity is less costly in terms of foregone return because public equity is assumed to be a close substitute of private equity. That is a change in the private equity cap has relatively little effect on expected total fund return as long as public equity weightings can be adjusted accordingly to compensate.

George Diehr:
All right.

Farouki Majeed:
This is, again, just a last ratio. Alternative portfolios at the same level of risk, right?

Raymond Venner:
Yep.

Farouki Majeed:
That's what, that's what is shown here. These are all portfolios that have the same level of risk, slightly different returns, and Ray is trying to illustrate what kind of allocations would change in order to achieve that.

Raymond Venner:
Portfolio B-4 has a 3% allocation to commodities. The upper limit was 10%, but the, when we ran the optimizer it, given this 11.92 fairly aggressive portfolio, the optimizer did not assign much to inflation linked bonds, but it did assign a 3% allocation to commodities. And, as a result, this portfolio did have a higher expected return.

Slide Five. For Slide Five the fixed income allocations are unconstrained. The weightings of diversified fixed income, inflation linked bonds, and treasuries can each range from zero to 100%. The only portfolio with an expected return above 7.5%. F-6 to F-8 all have a target fixed income weighting below 15% and all have an equity weighting above 73%. For example, F-6 has a high expected return, 7.75% because the equity weighting is 73%. Or, 10 percentage points above the equity weighting of our current policy portfolio.

Slide Six, lists unconstraint portfolios. The weighting of each investment should range from zero to 100%. The expected returns of portfolios U-5 to U-7 are high because these portfolios have no fixed income. Given the extreme allocations to illiquid investments and exposure to growth, these portfolios are intended to be illustrative only.

So, unless the committee members have questions or comments, we'll move on to the use some characteristics.

Henry Jones:
Yeah. Thank you. Yeah, I'm glad you pointed out that this was for illustrative purposes only. But when I look at, even though it's for illustrative purposes only, and on this chart, and on previous ones, the volatility numbers change based on the assumptions that you have used. And, so the one that you look, provided to us on Four, you said that you left the volatility rate the same all the way across.

Raymond Venner:
Right.

Henry Jones:
Well what I wanted to know, how much risk earns me additional returns? So, why wouldn't you move volatility on that so you can see what the additional risk is getting you in additional returns?

Raymond Venner:
We answer that question in the other slides. But we try to address two different questions. One is if you, the first question on Slide Four was, if you have a constant volatility, what happens to your asset mix if you change the constraint? And, what happens to the expected return? And, what we're trying to get at is, how costly was the constraint? If you're, for example, what we found is that the constraint on real estate was more costly than the constraint on private equity. And that made sense to us intuitively because we assume that public equities is a close substitute. That's what we were trying to get at was, if, how costly were the constraints? And to answer that question to have more of a apples to apples comparison we had to keep the volatility the same for all the portfolios. And then we just changed the constraints to see how, what the effect was on the portfolio with respect to return.

Henry Jones:
But if we were to assume we, one of these assumptions, then we would have to go back and rerun the numbers so that we know what additional risks we may be taking?

Raymond Venner:
Right.

Henry Jones:
Okay.

Raymond Venner:
Right. We tried to capture that on F-5 and F, on slides, on the next slides five and six. But, you know, we could have done more portfolios addressing that.

Henry Jones:
Okay.

Alan Milligan:
Henry?

Henry Jones:
Okay.

Alan Milligan:
I point out that in fact Portfolio U-6 actually has a very similar level of risk to the A-7. It's a bit higher. Now, but because you have no constraints, there would

only be one portfolio that will come up with an 11, huh, the same level of risk. So it wouldn't have been picked. To keep the risk the same would have been very uninformative, because all of the portfolios would have come out the same.

Henry Jones:
Hmm-hmm.

J J Jelincic:
Yeah, I just wanted to point out U-7 would scare even Yale.

Raymond Venner:
All right. All right, now we'll review some portfolio characteristics. And, just a quick comment from Dr. Diehr's earlier comment is that given that there is an unlimited number of policy portfolios for purpose of present, of developing and presenting characteristics and layer decision factors, you know, we needed to identify a subset. But, but that need wasn't intended to limit your choice at all. So.

George Diehr:
That's right, a bit A-10.

Raymond Venner:
It's completely the committee's call.

Farouki Majeed:
You can pick one and say if you want it to be tweaked this way or that way, that can be done. Yeah. So, you're not selecting a final portfolio today. You, there will be a preference ranking to give us some directions and we'll come back to you in December with some alternatives that you might like to see.

Raymond Venner:
Okay. Slide Seven shows the contribution portfolio risk. Which is a variability of total fund return explained by the returns of any investment. The more conservative portfolios are the most risk diversified. For A-7, public equity and private equity combined. Explains about 90% of the variation total fund returns.

Skipping ahead to Slide Nine. Slide Nine lists the simulated portfolio returns since 1970 by economic growth environment. As shown by the red bars, when economic growth was weak, real returns were negative for all portfolios but A-1 and much worse for the equity centric A-7 and A-8 as shown by the blue bars, moderate to strong economic growth, favored all portfolios, especially the riskier ones.

The annual real returns over all periods, the green bars are positive because growth was moderate or strong 80% of the months. Over all periods, the higher

risk portfolios A-7 and A-8 just slightly outperformed the more conservative ones because equities only just slightly outperformed bonds since 1970.

Going …

Farouki Majeed:
Did, did … Let me just make a comment. These are the sort of back tested results that you wanted to see for each of the portfolios that are being presented. So we are showing you the average component return over this period, the historical period, as well as what the returns might have been during certain environments, growth environments as well.

If you have any questions on this subjects issue.

Raymond Venner:
So, going forward …

Farouki Majeed:
Yep?

Henry Jones:
That's okay. Go ahead.

Raymond Venner:
Going forward we expect greater outperformance from the riskier portfolios. Since 1970 declining bond yields have boosted bond values and returns. Ten year treasury yields have declined from 7.7% at the start of 1970 to 2.5% today. This decline in past bond yields has boosted past bond returns, but lower yields today imply low future bond returns.

Slide Ten.

J J Jelincic:
So are you really saying you expect the more aggressive portfolios to do better? Or, are you saying that the more conservatives will do worse? If you're really driving it off the fixed income return.

Raymond Venner:
We're expecting a similar equity return premium. That equities will outperform bonds by a similar amount as they've done historically. But, bond returns will be lower. Therefore, total fund returns will be lower.

Slide Ten. The simulated portfolio returns by inflation environment. The real returns of all eight portfolios were strongly negative during months of high inflation. Strongly positive during months of low to moderate inflation. High inflation was unfavorable for both equities and nominal bonds. And, favorable

only for inflation linked bonds and commodities since 1970. And we see the, all portfolios did poorly during high inflation because all eight portfolios have relatively small investment in the inflation link asset class capped at 4%.

J J Jelincic:
And, in this, these portfolios one through eight, they're A One through Eight?

Raymond Venner:
Yeah. Yeah.

Slide Eleven shows the estimated peak to trough portfolio losses during the two recent equity bear markets, the first ending in '03 and the recent downturn ending in the last, early last year. Global equities lost about one half of their value during both downturns. Portfolio A-7 experienced losses of 27 and 46% while the more conservative portfolios experienced much smaller losses. How likely is another downturn? Well, since 1928 U.S. equity losses of 45% or more occurred on average once every 14 years, while losses of 20% or more occurred on average every six years. Since the last downturn ended last year, we might hope, well, maybe the next downturn will hold off for another five years. But as we all know, markets have an unfriendly habit of paying no heed to our expected or required or hoped for returns.

Finally, Slide Twelve shows the estimated cash yield for each portfolio. Given the current low bond yields, the cash yield is similar across all portfolios, from 2.3 to 2%. Also, the allocation to illiquid investments, again, is 27% for all of these base line portfolios.

So, inclusion, our current policy portfolio is near the high end of risk given the minimum 20% allocation to fixed income. And our current portfolio is highly depended on global equity turns and will occasionally experience large losses.

Henry Jones:
(Indiscernible).

Raymond Venner:
Glad to take questions.

George Diehr:
See, run the 20%, why we need 20% fixed. Yeah. Tell me again what the reasoning is that set that level? Is that, is that for, is that cash flow, or?

Farouki Majeed:
I will, I would say a prudent level of diversification. Otherwise, you would have even higher allocations to equity. Right? The combined equity is now roughly about 2/3 of the portfolio. So, if you were to further reduce fixed income, you

would be in excess of 70% or so in terms of, you know, equity. And one might then look at that say they are, they are really diversified portfolio.

George Diehr:
But if you loosen the constraint on infrastructure, let's say, would go, do you have any sense, would it go there? Would the reduction of fixed go into infrastructure instead of, which is obviously pretty illiquid, but?

Raymond Venner:
Right. Given the assumptions, the optimizer favored infrastructure and forestland. And, we, we could always do more analysis, but our thinking is that if we, next time we have a sustained bare market, equities are falling over, you know, over multiple months, we want enough in fixed income so that we can sell the fixed income, rebalance, you know, several percentage points, maybe at least five percentage points from fixed income to equities and still have enough fixed income left to provide cash flow since we're negative cash flow and provide liquidity and remain a safe port. That's sort of the high level of that.

George Diehr:
Uh-huh. Okay. All right. I don't. Are we going to do the return forecast for current class? I don't know. We need much (indiscernible) it doesn't look dramatically different, but do you want to? Your last three?

Raymond Venner:
Oh. Huh.

George Diehr:
Your last three or four slides? It's, it's …

Raymond Venner:
Yeah.

George Diehr:
Is there anything?

Raymond Venner:
No. Those are more, those are more of appendix, they're more related to the, with the current asset classes. So we're. Unless the committee has a preference, we'll just stay with the, all the assumptions that we've addressed under the alternative.

George Diehr:
Yeah. Yeah. I think that's why, I didn't see much of particularly different or enlightening there.

Joseph Dear:

We put those in, in case you decided to stick with the old classification.

George Diehr:
Yeah. Right. Right. Okay. Well we can change our. You know. It was just advisory. All right. More comment? We're …

Farouki Majeed:
Yeah, I think …

George Diehr:
Yeah, I'm sorry. Do you have?

Farouki Majeed:
I thought Mr. Jones had a question previously? Because he was?

Henry Jones:
Yeah. I was, I was looking. Yeah. Thanks for. I was looking at the back testing and you cover 1970 to 2010. And I was really trying to focus on doing, and then somewhere during the course of yesterday. I don't know if it was Wilshire, or your documents. But you highlighted those distress periods. And, so that was, is what I was trying to get to. Well, what would have happened during those other distress periods if we had these scenarios? But, now it's kind of masked in the good years and the bad years. So, does that make sense?

Raymond Venner:
Well, we sort of address it through the slide that shows what the portfolio returns would have been during these equity market, equity bare markets. On Slide Eleven. I mean, we show, for example, like A-7. Like our portfolio in the latest bare market, that's from November of '07 to February of '09.

Henry Jones:
Okay.

Raymond Venner:
We would have lost about 45%. If you look at our reported returns, our reported returns were less because of the write downs were not taken until later. Some of the write downs that lead to liquid investments.

Henry Jones:
Okay.

Farouki Majeed:
Our actual drawdown, the maximum drawdown from November of '08 to March of '09 was 37%. The actual decline in current value.

Henry Jones:

Okay.

Farouki Majeed:
This is sort of back tested on these portfolios.

George Diehr:
Did you, in the simulation, did you give any consideration? You said you did both with the straight normal distribution of one where there was per (indiscernible) or something. Did you consider, try any modifications where the main reversion of facts, I mean, the fact that these things are not completely random, was simulated?

Raymond Venner:
Yeah, for that we, for that we just looked at the historical returns and we assigned a distribution that seemed to math pretty closely. We used a student's T distribution with a, with a small enough degrees of freedom.

George Diehr:
Uh-huh.

Raymond Venner:
So that the left tail was thicker than the normally distributed.

George Diehr:
But nothing with any serial correlation of measuring?

Raymond Venner:
No. No. We didn't account for that.

George Diehr:
Nothing, nothing like that? It was just a …

Raymond Venner:
It was just the thickness of the higher frequency of extreme loss.

Farouki Majeed:
Still assuming independent …

George Diehr:
Yeah. From period to period.

Farouki Majeed:
… for lender movement.

George Diehr:
Just draws independently out of the distribution.

Farouki Majeed:
Yeah. Yeah.

George Diehr:
All right. Further questions? Okay. We have to, we have to …

Comment from female panel member:
We have to … Terry. Terry first.

George Diehr:
Oh. Terry. Okay. Excuse me. Now I …

Terry McGuire:
I changed my mind, George.

George Diehr:
All right.

Terry McGuire:
The, the minimum allocation for liquidity to treasuries combined with extension on this, what results in the 20%? And, when you go back to the very, I guess Page One, the compound return expected, you know, for liquidity and for fixed income is basically the lowest of any in these investment options. And, in some respects they overstate the current environment, because liquidity provided by treasuries of 4% of your portfolio has been earning about 25 basis points or something like that. Not, you know, three and a half, three and a quarter in the current market. Yet everything is premised on 4% of the portfolio. That's a minimum constraint. And I really have to question that because when you go back and look at what transpired last time we had this scary, or liquidity issue which was driven, as Joe said, by the securities lending program, basically we did realize somewhat on treasuries and fixed income and produced some liquidity. But it also, we relied on equity. The equity markets stayed liquid. And, some could argue in some respects, going to benefit a little bit relative to what happened in that environment by possibly going slightly under equity in that situation.

Anyway, I guess my, another thing that I'm thinking about in relation to this is that we're going through an organization restructure. I think one aspect of that is going to focus on the CFO role relative to the organization. And, you know, that's one of the main responsibilities of that position is really going to look at cash flow needs, not just of the investment portfolio, but the overall organization. And I think that liquidity requirement could be reduced considerably, you know, because of that. And/or, there are potentially some other very cost efficient options to provide that liquidity and we wouldn't have to have that minimum constraint. So I think this that could produce anywhere from 10 to 20 basis points of increased yield by moving that 4% down to one percent, or even less,

because there are other options to look at that. I think that's something I'd like to have looked at, because, you know, it's just, I think, you know, blame fixed income, I have my backgrounds in fixed income, but in the current market environment and over the next ten years I'm not optimistic about fixed income returns contributing to the portfolio. I think its biggest benefit is to somewhat guard against the equity risk exposure as you mentioned, Farouki.

Farouki Majeed:
Yes.

Terry McGuire:
But, that sort of summarizes, you know, my thoughts relative to the options that we have here. I think the inflation constraint portfolio B-4 with possibly a lower one percent liquidity constraint in treasuries might be sort of a direction we might want to look at before we really get into talking about portfolios and, if we move in this direction. I'm not really. Who knows what outcome we're going to have. But, I'm somewhat concerned about these constraints for fixed income and liquidity.

Farouki Majeed:
Let me address some of those concerns. Now, I think, you know, when you say you're talking about this liquidity portfolio, we have called it liquidity, but it's not exactly the same as the existing cash portfolio in the way it stands. That's why we have a higher expected return because it's going to be a treasury index, which means treasuries of all maturities. So, essentially, this is one part of the government bond portfolio. And, so you can say 4% here for government bonds, and then within fixed income they might have 28, 30% or so of government bonds. So, if you add all of that up, it still doesn't amount to a huge percentage of exposure to treasuries. But, all this does is that, is it's in addition to just liquidity, it's looking for a slightly higher duration and so on. It's intended along the way to be part of this equity hedge and liability hedge bucket. So it's evolving in that role. We currently called it liquidity simply for the reason that the gloom of fixed income portfolio would continue to exist as it is at the current benchmark, which has some (indiscernible 01:00:43) treasuries as well. So I think that's part of the. So I think when you said that the yield on this would be like 25 basis points, or whatever, compared to what we assuming is three, it's because this portfolio now would be benchmark to the aggregate treasury index. And I share your concerns that, at this point, that bond yields are at historic lows and that's one reason why it's been capped at 4%. Otherwise, you would want to have government bonds as a strategic part of your policy portfolio and perhaps at a higher percentage. You know, under normal circumstances. Maybe if you are looking at five year ago or something. I, I, does that address, huh?

Terry McGuire:
No. I don't really think it does.

Raymond Venner:
Okay. Just a quick comment. We'd be glad to run portfolios with smaller allocations to treasuries.

George Diehr:
Mr. recently reelected treasurer, congratulations.

Bill Lockyer:
Thank you. I apologize for, uhm. First of all, thank you all for your focus and attention. I seem to have been expected to be in three places at the same time and haven't quite figured it out yet. But, but I did want to at least kind of ably represent us. But I wanted to at least make a couple quick comments for the fragment of the next meeting. I share Terry's general perspective in this context. We know generals prepare for the last war. Investors make the same mistake. And, because various risks (indiscernible) us to bad results doesn't mean that we should now become overly conservative about investing. And I think that's partly what Terry was saying. The only other, with respect to the riskier things that we do, so much of it is, if not index, it's fund to funds. I just continue to ask the question, what do you get when you give some manager two basis points for their recommendations? I'm just not sure what you get for that. But, I don't have an alternative yet, other than to continue to create internal capacity. But, anyhow, I share Terry's observation that, that we want to be careful and not drag down the return excessively by overloading bonds and other fixed income. Thank you.

J J Jelincic:
Farouki, you said something that surprised me. This is the first time that I have understood that part of fixed income, or income component, would include govies. I, my understanding all along had been that we were moving all the treasuries down to our liquidity bucket and the fixed income bucket would exclude govies. And, today for the first time I, at least thought I heard that my assumption was wrong. So, Curtis will contin … in the fixed income portfolio there will continue to be govies?

Farouki Majeed:
Yes.

J J Jelincic:
Okay. I just.

Farouki Majeed:
And they have a range around which they can invest. And I think that is currently, uhm.

J J Jelincic:

Well. But I had assumed that if we adopted the new asset allocation model we would adjust the policy to reflect that. And, so. Okay. I'm glad it came out at this point.

George Diehr:
All right. I see no further requests to speak. We're 20 minutes early, so people just sit quietly in your chair. We'll take a break at 10:00. Okay. Let's stay ahead. Let's come back at five to ten and get rolling on pushing our buttons here.

End of Segment 5.